

CLAIMS

- 1 A hydraulic transmission system for use with at least one water current driven turbine rotor, characterised in that a low speed high pressure pump or pumps (24,24A) is/are arranged to receive operational drive from the turbine rotor (6,20), and to deliver high pressure output to a high speed hydraulic motor or turbine (35) in such manner as to produce an increase of the shaft or motor speed accompanied by a corresponding reduction of torque required to drive electrical generators or other machinery (38) as compared with the shaft speed of the turbine rotor or rotors.
5
- 10 2. A hydraulic transmission system as in claim 1, and characterised in that a substantially closed hydraulic fluid circuit (27,31,33,34) is provided for said hydraulic fluid associated with the low speed high pressure pump or pumps (24,24A)
- 15 3 A hydraulic transmission system as claimed in claim 1 or 2, and characterised in that the hydraulic fluid for said high pressure pump or pumps is/are arranged to be recirculated from a high speed hydraulic motor or turbine (35) through a low pressure fluid return line or lines (34) to feed said low-speed high-pressure hydraulic pump or pumps (24,24A).
- 20 4. A hydraulic transmission system as in claim 1 2 or 3, and characterised in that the hydraulic fluid is water.
5. A hydraulic transmission system as claimed in claim 4, characterised in that the water required is originally be drawn from the water within which said turbine rotor or rotors (6) is/are is operationally located..

BEST AVAILABLE COPY

6. A hydraulic transmission system as claimed in claim 5, and characterised in that any loss of the water is arranged to be made up by drawing replacement water from the water within which said rotor or rotors (6,20) is/are operationally located.

5 7. A hydraulic transmission system as claimed in claim 6, and characterised in that such make up water is filtered to remove suspended solids or other undesirable pollutants before being stored in a header tank (41) situated in such a position that it can feed make-up water into the system to replace and water lost through leakage.

10 8. A hydraulic transmission system as in claim 4, 5,6 or 7, and characterised in that since the hydraulic fluid is water is drawn from the operating environment of the turbine or turbines , a relatively high degree of fluid leakage can be tolerated, thereby to allow the use of larger than would otherwise be acceptable clearances relative movement for seals, the arrangement being such that the operation of the pumps can be optimised for mechanical efficiency rather than 100% retention of hydraulic fluid.

15 9. A hydraulic transmission system as claimed in any one of the preceding claims, and characterised in that each said rotor (6,20) is associated with a plurality of separate pumps (24, 24A) arranged to be operationally driven from the associated rotor (20), and in that the hydraulic fluid inputs (29) to the pumps are connected to receive fluid from a low pressure fluid plenum (28) and the output sides of all said pumps are associated with a common high pressure plenum (31) connecting via high pressure fluid circuit (33) with the hydraulic motor or rotor (35) coupled to drive a generator or other machinery (38).

20 10. A hydraulic transmission system as claimed in claim 9, and characterised in that a surge or pressure balancing arrangement (32) is provided in the high pressure fluid circuit.

-16-

11. A marine turbine installation incorporating a hydraulic transmission system as claimed in any one of the preceding claims.
12. A water drivable turbine installation including a hydraulic power transmission system for increasing the effective rotational speed of the turbine.

BEST AVAILABLE COPY